Health Assessment for

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INTERIM

WOODSTOCK MUNICIPAL LANDFILL

WOODSTOCK, MCHENRY COUNTY, ILLINOIS

CERCLIS NO. ILD980605943

MAY 21, 1992

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Agency for Toxic Substances and Disease Registry

THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104 (i) (7) (A) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term 'health assessment' shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risks assessments, risk evaluations and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR has conducted this preliminary health assessment on the data in the site summary form. Additional health assessments may be conducted for this site as more information becomes available to ATSDR.

The conclusion and recommendations presented in this Health Assessment are the result of site specific analyses and are not to be cited or quoted for other evaluations or Health Assessments.

Use of trade names is for identification only and does not constitute endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

INTERIM PRELIMINARY PUBLIC HEALTH ASSESSMENT

WOODSTOCK MUNICIPAL LANDFILL
WOODSTOCK, McHENRY COUNTY, ILLINOIS
CERCLIS NO. ILD980605943

Prepared by:

Illinois Department of Public Health
West Chicago, Illinois
Under Cooperative Agreement with
Agency for Toxic Substances and Disease Registry

THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104 (i)(6)(F) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term "health assessment" shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessment, risk evaluations, and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR prepared this Interim Health Assessment using available data and information. ATSDR will re-evaluate this site and prepare an updated health assessment as warranted by the availability of additional data and information and as resources permit.

SUMMARY

The Woodstock Municipal Landfill site, a 45-acre landfill in McHenry County, Illinois, operated as an open burning dump from 1940 until 1965 when it was converted into a sanitary landfill. Landfilling operations continued until July 1976. The fill is reported to be 60% industrial waste of unknown origin. Before the final cover, excessive infiltration caused leachate seeps. Kishwaukee Creek, flowing on two sides of the site, receives recharge from shallow groundwater flowing through the site. A low fence surrounds the site but does not restrict trespassers. Limited soil sampling results have shown heavy metals, 1,1,1-trichloroethane, chloroform, and 4,4 DDT. Potential human exposure pathways include direct contact with leachate seeps, ingestion of contaminated soil, groundwater, and biota, and inhalation of fugitive dust and volatile compounds. The site is considered an indeterminate public health hazard because the available information does not indicate that exposure has been at levels of public health concern, however, there is a lack of information on: sediment and surface water contamination in Kishwaukee Creek; on-site soil and leachate contamination; location and use of private wells; potential of groundwater contamination; ambient air contamination, and the potential for contaminated biota.

The Woodstock Municipal Landfill site has been evaluated for appropriate follow-up with respect to health activities. Because there is no indication that exposure to site contaminants at levels of public health concern is occurring or has occurred, this site is not being considered at this time for follow-up health activities. However, if a completed Remedial Investigation suggests that exposure to significant levels of hazardous substances is occurring or has occurred, a revised health assessment will be developed, and IDPH, in conjunction with ATSDR, will reevaluate the site for any indicated follow-up. As part of the ATSDR Physician Education Cooperative Agreement, IDPH will inform area health professionals of the public health implications associated with the site and with others in the area.

BACKGROUND

SITE DESCRIPTION AND HISTORY

The Woodstock Municipal Landfill has been proposed by the U.S. Environmental Protection Agency (EPA) for inclusion on the National Priorities List (NPL). The 45-acre site is in McHenry County, Illinois (Section 17, T44N, R7E), immediately south of Davis Road, approximately 550 feet south of U.S. Highway 14 and about 1400 feet west of Illinois Highway 47 (Figures 1 and 2). The landfill is on the southern edge of Woodstock and is within the city limits. The topography of the surrounding area is mostly level, with a general gradual slope to the south-southwest. The site itself consists of east-west trending uplands; however, a swampy lowland occupies its southern portion.

In 1940, the site began operation as an open burning dump. In 1965, it was converted into a sanitary landfill, and operations continued until July 1976, when it was closed. In October 1980, it was placed on the Illinois Environmental Protection Agency's (IEPA) "closed and covered" list. Cover over most of the site consists of 2 to 3 feet of loam, silty loam, silty clay loam, and sandy loam. The fill is reported to have been 40 percent household and garden refuse and 60 percent industrial waste of unknown origin. Lime soda sludge was placed in the swampy southern and southeastern portions of the fill area.

The glacial drift of the area averages about 200 feet in thickness. The hydrology of the site indicates that groundwater flows in all directions away from the northern upland portion of the landfill. In the older part of the filled area (southern portion), the gradient is primarily southward to the swampy areas bordering the landfill, or to the drainage ditch west and southwest of the site. A vertical gradient exists between the two aquifers under the site, which are (1) a shallow sand and gravel sand aquifer, and (2) a deeper silty clay till aquifer. A number of interbedded sand and gravel lenses exist in the till under the landfill, which would tend to magnify horizontal components of flow.

In the late 1960's, infiltration into the landfill was calculated to be 22,500 gallons per day, partially due to the inadequate and permeable cover. No quantitative evaluation of flow from the site has been made because of the complex geology.

Leachate seeps on the southern edge of the landfill were known to exist as early as 1970. In that year, ways were explored to treat landfill leachate at the sewage treatment plant being constructed south of the site. However, limited analyses of the leachate detected mainly iron, chloride and total dissolved solids, which sewage treatment would not greatly reduce.

Additionally, for those constituents, concentrations in the drainage ditch downstream from the site did not differ appreciably from those upstream from the site. After the landfill was closed and covered in 1976, leachate from the seeps was substantially reduced. However, there is evidence of groundwater mounding within the southern portion of the landfill, which may eventually compromise its integrity and cause new leachate seeps to develop.

Kishwaukee Creek, at this point a channelled drainage ditch, flows on the western and southern sides of the site. That is the only source of surface water in the area, and it receives recharge from shallow groundwater flowing through the site. The ditch also drains the area north of U.S. Highway 14, as well as the area in the vicinity of the landfill. A short distance south of the landfill, the city of Woodstock sewage treatment plant releases approximately 690,000 gallons per day of treated effluent into Kishwuakee Creek. The total flow of water in the stream is about one million gallons per day.

Approximately 25 miles downstream from the landfill, the ditch becomes the Kishwaukee River, used for various recreational purposes including boating, fishing, and swimming.

Between 1970 and 1974, IEPA began corresponding with officials from the city of Woodstock concerning the following violations at the landfill:

1. Indiscriminate dumping near the fence at Davis (frontage) Road;

2. Wood, brush and combustibles not being covered as required;

3. Liquids being deposited on the site;

4. Final cover of exposed refuse being inadequate.

A permit granted to the city of Woodstock in 1972 allowed the site to be operated as a solid waste management site. Conditions of the permit required a leachate collection system and a network of monitoring wells to be installed. Between 1974 and 1976, the IEPA cited the city of Woodstock for various permit violations, including the following:

1. Leachate collection system and monitoring wells were not installed;

2. Final cover at the landfill was inadequate;

3. Non-permitted sludges from Woodstock Die Casting were being dumped;

4. Non-permitted lime sludges from the wastewater treatment plant were being accepted.

References reviewed to develop this public health assessment include the following Illinois EPA files in Maywood, Illinois;

1. Hydrology of Solid Waste Disposal Sites in Northern Illinois.

2. A Final Report on a Solid Waste Demonstration Grant Project.

3. Report SW-12d. G. M. Hughes, R. A. Landon, R. N. Farvolden. Illinois State Geological Survey, Urbana, Illinois.

SITE VISIT

Site visits were conducted on April 12, 1989 and August 31, 1991 by staff from the Illinois Department of Public Health (IDPH) and on November 7, 1991 by IDPH and the Agency for Toxic Substances and Disease Registry (ATSDR). On the noerthern and northwestern sides, the site is surrounded by a low fence with signs that read, "Warning; this area contains hazardous materials; no trespassing." However, the fence is low and is no real barrier against trespassers. A taller fence on the western side is discontinuous, while the southern and southeastern sides are unrestricted. The landfill is covered by grass, brush, and trees.

DEMOGRAPHICS, LAND USE, AND NATURAL RESOURCE USE

Light industry (offices, retail stores, small business, and restaurants) exist to the east, west, and south of the site. Some rural residences are located within a three-mile radius, and those would house approximately 1500 people. The main population of Woodstock is north of the site, and a three-mile radius would encompass the entire population of about 12,500. Approximately 200 homes outside of the city limits and downgradient from the landfill draw water from wells in the sand and gravel aquifer. Those wells vary in depth from 40 to 240 feet, but are generally at 200 feet. A private well is about 300 feet north of the northeastern corner of the site, at the house shown in Figure 2.

Woodstock draws water from five municipal wells, which vary in depth from 114 to 205 feet and are screened below 100 feet. Those wells are two to three miles north of the site and are upgradient of it. However, there may be hydraulic connections between those wells and the landfill. Groundwater flow and its

possible contamination are incompletely characterized at this site.

The sewage treatment plant is adjacent to the eastern portion of the southern side of the landfill, and it is between the site and Kishwuakee Creek.

In winter, the site is used by snowmobilers, and hunters use the wetland areas south of the landfill.

At present, the landfill is zoned for single family residences. While the city of Woodstock currently has no plans to sell the land, that could take place in the future.

STATE AND LOCAL HEALTH OUTCOME DATA

Based on the evaluations performed as part of this health assessment, there are indications that humans may have been exposed to site-related contaminants. In addition, community health concerns related to the site have been reported in the past. The follow-up health actions that have been proposed by the Health Activities Recommendation Panel (HARP) do not include an evaluation of health outcome data because the exposure was not believed to have been at levels of public health concern, and there is incomplete information concerning the extent of contamination in the groundwater, leachate, and soil. However, future health assessments that are prepared for the site will include an evaluation of health outcome data, if warranted.

COMMUNITY HEALTH CONCERNS

The members of the McHenry County Defenders (MCD) are concerned about possible groundwater contamination since all their drinking water comes from local, private and municipal wells. Part of their concern involves the high number of industrial activities in the area.

Another concern is the potential for surface pollution from contaminated groundwater. Since the site is in a floodplain, the MCD members were concerned that pollution will be washed down the Kishwaukee Creek.

Persons living near the site are fearful about the health effects on their children who have used the readily accessible landfill as a playground.

Both MCD and other residents have expressed concern about the selection of a remedial alternative and about the cost involved, particularly because the City of Woodstock has been named a

Potentially Responsible Party (PRP). Finally, the residents are distrustful of government agencies' responsiveness and honesty.

ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS

Limited environmental sampling at leachate seeps were conducted in March 1985. Three soil samples were analyzed for the following priority pollutants: volatile organic chemicals (VOCs), base/neutral acid extractables (BNAs), pesticides, polychlorinated biphenyls (PCBs), and metals. Sample 1 was obtained at the west central side of the landfill, sample 2 was collected at the south end west of the sewage treatment plant, and sample 3 was taken approximately 20 feet west of sample 2. Contaminants in the samples are listed below:

	Soil Sample 1	2	3
Contaminant	mg/kg	mg/kg	mg/kg
Aluminum (Al)	4930	1530	7320
Arsenic (As)	--	27	8
Barium (Ba)	1120	--	--
Cadmium (Cd)	11	11	--
Chromium (Cr)	36	--	124
Copper (Cu)	762	49	131
Lead (Pb)	345	16	38
Nickel (Ni)	632	56	45
Silver (Ag)	--	13	--
Zinc (Zn)	7890	1790	1070
Chloroform	91	440	400
1,1,1-trichloroethane	100	32	44
4,4'-DDD	128	--	--
4,4'-DDE	140	--	--
4,4'-DDT	69	--	--

More information on contaminants in groundwater, sediments, soil, and surface water has recently become available, and will be incorporated into the full public health assessment.

TOXIC CHEMICAL RELEASE INVENTORY (TRI)

The 1987, 1988, and 1989 TRI was searched for chemical releases from the Woodstock Municipal Landfill and other facilities in McHenry County. Landfills are not reportable facilities in the TRI database, therefore, the site was not listed. Within McHenry County, 126 chemical releases to the air, water, and land were

reported. Some of these releases were the same contaminants found in the landfill.

PHYSICAL AND OTHER HAZARDS

Physical hazards at the site consist mainly of uncovered areas of tree trash and construction debris. Also, there is an abandoned storage tank about 8 feet in diameter and 12 feet long on its side in the southern end of the property.

ENVIRONMENTAL AND EXPOSURE PATHWAYS

The potential environmental pathways for contamination include bioconcentration and bioaccumulation in the food chain, as well as contaminant migration through groundwater, soil, and air. Groundwater is the primary route of concern. The aquifer from which private and municipal wells draw could possibly become contaminated because of downward and lateral movement of leached materials through the glacial drift.

Potential human exposure pathways include direct contact with leachate seeps around the landfill, which are close to the drainage ditch (Kishwaukee Creek or River). Exposure pathways could also include the ingestion of contaminated biota, groundwater, or soil, as well as dermal contact with chemicals in on-site soils or water from the drainage ditch. They also include the inhalation of airborne dust or volatile compounds.

PUBLIC HEALTH IMPLICATIONS

The potential environmental pathways for contaminant transport include groundwater, surface water, soil/sediment, and air, as well as bioaccumulation and biomagnification in the food chain. Human exposure to site-related contaminants could occur through ingestion of water, soil, or food, as well as through dermal contact with polluted surface water or on-site soils. Exposure to on-site contaminants would probably be greatest for future on-site residents, especially if they use private wells for drinking water. Groundwater ingestion would be the most probable human exposure pathway. Significant exposure to contaminants in the drainage ditch is unlikely because of dilution from the effluent of the nearby sewage treatment plant. A toxicological evaluation of potential health effects is not possible at this time due to limited contamination and exposure data. ATSDR has prepared, or will prepare, Toxicological Profiles on the site contaminants.

COMMUNITY HEALTH CONCERNS EVALUATION

1. MCD members are concerned about possible groundwater contamination since all their drinking water comes from local, private and municipal wells.

Response. Groundwater is the primary environmental pathway of concern. Additional data and information is needed to determine the extent and potential for contamination of the drinking water supply. A more in-depth public health assessment will be prepared as the Remedial Investigation report becomes available.

2. Concern for surface water pollution, in particular the Kishwaukee Creek, has been reported.

Response. There is the potential for sediment and surface water contamination from groundwater discharge, leachate seeps around the landfill, and surface runoff. As stated above, this pathway will be investigated as the necessary data becomes available.

3. Persons living near the site are fearful about the health effects on their children who have used the landfill site as a playground.

Response. There is currently no indication that exposure to site contaminants has occurred at levels of public health concern, however, this preliminary health assessment is based on a limited amount of environmental data and no health data. A subsequent public health assessment will reevaluate these concerns based on additional information.

4. Residents have expressed concern about the selection and associated costs of a remedial alternative.

Response. The subsequent public health assessment will evaluate the health issues associated any remedial alternative that may be selected. ATSDR does not have the authority or responsibility to evaluate costs of remediation.

CONCLUSIONS

Based on the available information, the site is considered an indeterminate public health hazard because the available information does not indicate that exposure has been at levels of public health concern, however, there is a lack of information on sediment and surface water contamination in Kishwaukee Creek; on-site soil and leachate contamination; private well survey and the potential for groundwater contamination; ambient air contamination, and the potential for contaminated biota.

Further environmental characterization and sampling of the site and affected off-site area during the Remedial Investigation and Feasibility Study (RI/FS) should be designed to address the environmental and human exposure pathways discussed above. When additional information and data become available, e.g., the completed RI/FS, such material will form the basis for further assessment by IDPH and/or ATSDR at a later date.

RECOMMENDATIONS

Because of the lack of on site environmental data and potential for direct contact to soils and leachate, site restriction should be reinforced.

Lack of sufficient environmental data at this site is a serious limitation to evaluation of the potential hazards. Further evaluation should include the following:

1. air sampling,
2. monitoring well sampling,
3. residential well sampling,
4. sampling of leachate,
5. surface soil sampling,
6. sediment sampling,

In addition, further characterization is necessary to evaluate:

1. groundwater flow and velocity,
2. contaminant uptake by stream biota,
3. area demographics, and
4. landfill cover integrity.

HEALTH ACTIVITIES RECOMMENDATION PANEL (HARP) RECOMMENDATIONS

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, the Woodstock Municipal Landfill site has been evaluated for appropriate follow-up with respect to health activities. Because there is no indication that exposure to site contaminants at levels of public health concern is occurring or has occurred, this site is not being considered at this time for follow-up health activities. However, if a completed Remedial

Investigation suggests that exposure to significant levels of hazardous substances is occurring or has occurred, a revised health assessment will be developed, and IDPH, in conjunction with ATSDR, will reevaluate the site for any indicated follow-up. As part of the ATSDR Physician Education Cooperative Agreement, IDPH will inform area health professionals of the public health implications associated with the site and with others in the area.

If future IDPH/ATSDR evaluations indicate that a substantive completed exposure pathway exists or that the community has expressed specific health concerns, then health outcome data bases should be evaluated in future assessments or addenda prepared for this site.

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CERTIFICATION

This interim Preliminary Public Health Assessment was prepared by the Illinois Department of Public Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the preliminary health assessment was initiated.

Technical Project Officer, SPS, RPB, DHAC

The Division of Health Assessment and Consultation, ATSDR, has reviewed this interim Preliminary Public Health Assessment and concurs with its findings.

Director, DHAC, ATSDR

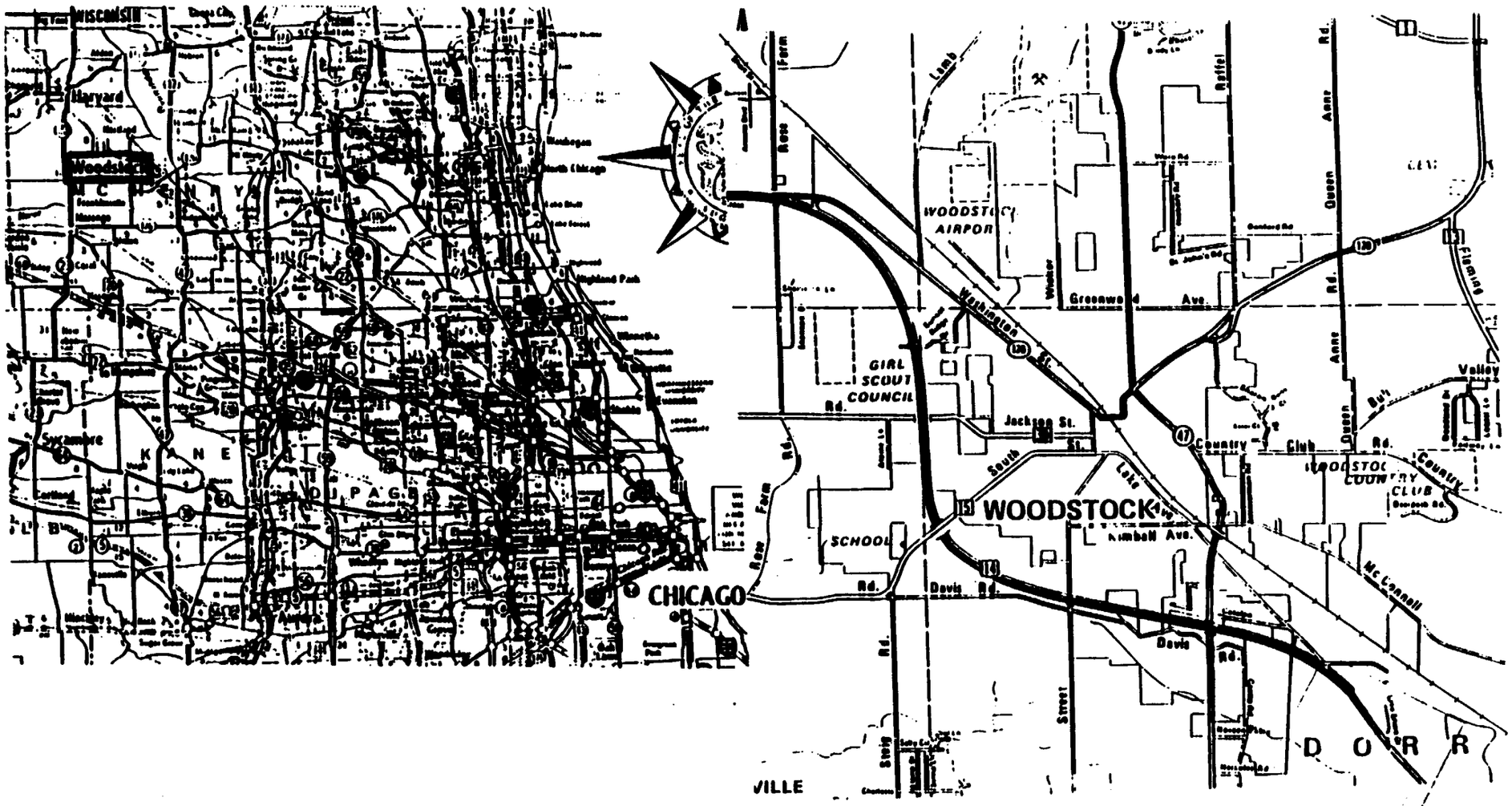

FIGURE 1. LOCATION MAP OF WOODSTOCK, ILLINOIS

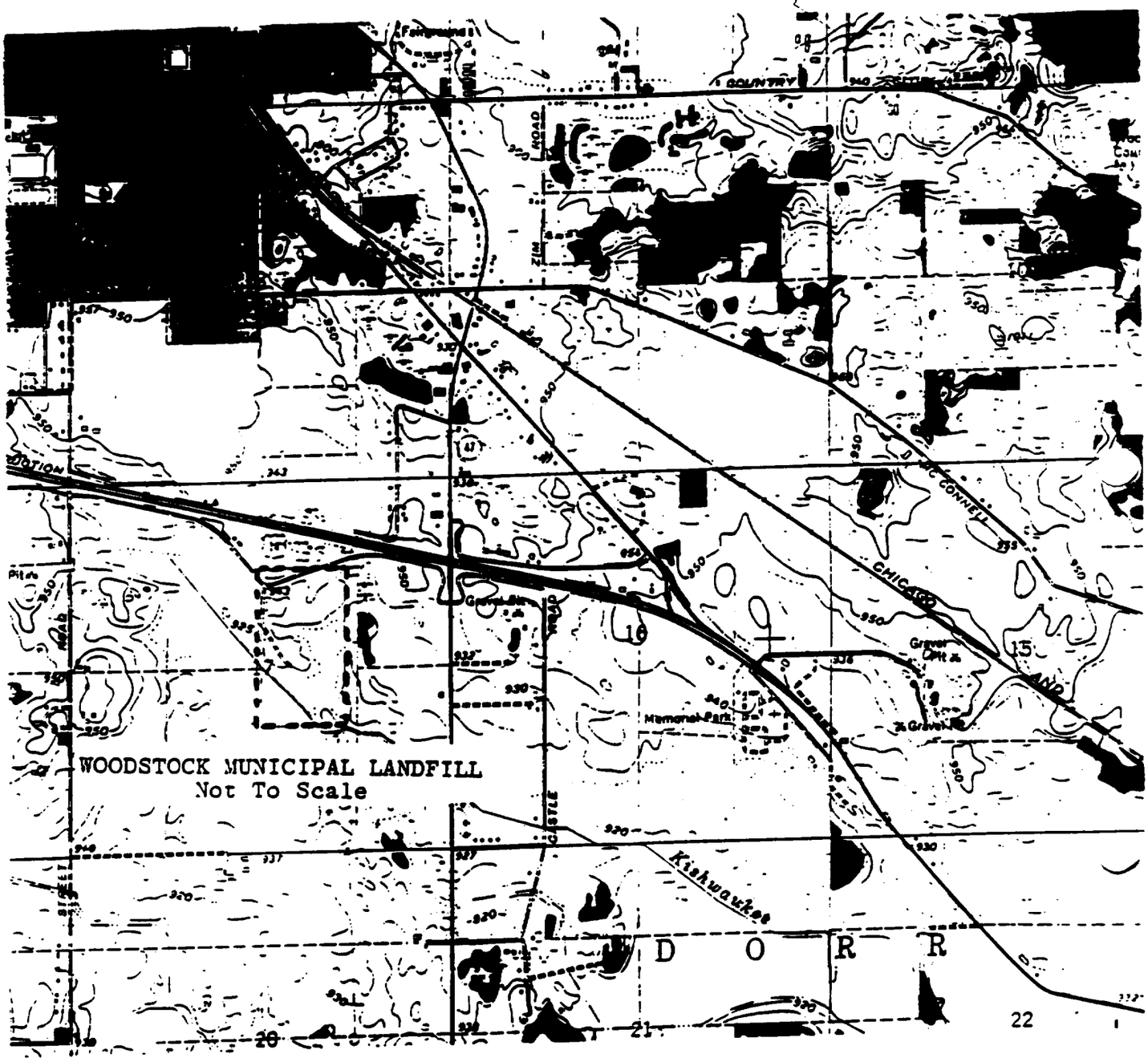

FIGURE 2. TOPOGRAPHY MAP OF WOODSTOCK MUNICIPAL LANDFILL AREA.